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PREFACE.

CONSUMPTION is unquestionably at the head of all the fatal diseases of the human body. No single malady appears even to approach it. How highly important then it is to institute a scientific enquiry into the principles which ought to regulate "Change of Air," when it is known, that after all remedies have failed, medical men recommend travelling, a sea-voyage, or some other expedient for change of air, as the *last resource.* Sometimes such changes produce wonderful effects, but it has never been theoretically explained on what grounds. "Change of Air" must, therefore, be said to be prescribed empirically, and not according to any rational principle.

I have endeavoured, to the best of my ability, to speak of the *fallacies* of the public on this

important subject, in a philosophical and practical manner; and I trust, by the avoiding of all unnecessary technicalities, the present work will be found useful, and afford comfort and consolation to those, labouring under the malady, whose means will not enable them to go *out of town*, in conformity with the usual recommendation and the usual custom.

Scrofula has been, and is frequently, confounded with Consumption, or considered to be co-existent in the same habit; but the difference between Consumption and Scrofula has of late years been more clearly defined, and the peculiarities of such are fully pointed out in the following pages.

Scrofula is commonly attended by enlargement of glands external to the body; and these frequently, if not discussed, suppurate, and continue discharging often for many years, if no counteracting remedies are employed: generally bones in the neighbourhood of such abscesses become softened, exfoliate, bringing the constitution to its lowest ebb, with great

prostration, and a slow, weak pulse. The peculiarities of Consumption are wholly of an opposite tendency; and hence the mischief of confounding the two, not only in adopting remedial means, but especially in recommending change of climate.

There is another very important point on which considerable error exists. The confounding of Bronchial with Tubercular affections; the bronchial often continuing to old age, whilst the career of Consumption is generally early and rapid.

Romney Terrace, Westminster.
July, 1848.

CHANGE OF AIR.

I WAS first led to investigate the subject of "Change of Air," in consequence of being frequently interfered with in the treatment of patients. Many were urged by their friends to try another climate, in the hope of being infallibly restored by that means to perfect health. They were assured, that "Change" rarely disappointed any one—"if it did no good, it did no harm." Many have thus lost their lives—many lingered in their sufferings, trusting daily to experience, not only a remission of symptoms, but a total cure of their complaints. Many are sent to the sea-side—many to fashionable Spas in various parts of England—many quit their domiciles for the South of France, Italy, Spain, Portugal, Madeira, or the West India

Islands. Year after year has seen consumptive patients expatriating themselves, to profit by the supposed immunity which tropical countries enjoy from the ravages of pulmonic decay. Yet we learn from the Statistical Reports of the British Army, that twice as many cases of Consumption originate in Jamaica as at home among European soldiers. The same fact was ascertained with regard to the East Indies. Consumption is twice as prevalent at the Mauritius as at the Cape of Good Hope, although an inflammatory state of the lungs is considerably more frequent in the latter colony. South Devon has long enjoyed a high reputation; and strange to say, consumptive patients have been generally recommended to have recourse to the sea-side, anticipating the health-giving property of the air of Torquay, Torbay, and other places in that beautiful county. I will not enlarge, as I might, on the disappointments that have been continually experienced; but the grave-yards of those places abundantly testify the deadly influence of misjudged recommen-

dations. I may here notice a few cases, to shew some of the injuries that are inflicted upon patients by injudicious medical advice.

Miss —— was attacked with hooping-cough in the month of February. The treatment recommended, was confinement to one room, where the temperature being equable, might assist the medicines in throwing off the inflammatory appearances. After a very short, I may say rational, treatment, every symptom became favourable, and I was led to hope the intelligent little girl would continue to go on favourably; but her friends, or rather the relations of her parents, strongly interposed, and recommended "Change of Air" as the only means left to effect an entire cure. Thus advised, the mother assented to the removal of her daughter; and after three days the inflammatory symptoms returned with violence. In two days more the child was dead.

A young gentleman, about twenty years of age, became indisposed—shiverings and fever supervened—and then there came on a pleuritic

attack: no uncommon case. I carefully and watchfully observed the symptoms, and proceeded with the treatment in the customary way. A favourable termination was the result. There yet appeared some slight hectic symptoms, and the usual elevated pulse, for which I prescribed with effect; but while every thing promised fair for the patient, I was one morning written to by the father, to say, that my patient was about to be removed to the sea-side, as weakness was the only ailment that remained. My argument about the dangers of such a premature course was unheeded; for the reply was, "that every one recovered by 'Change of Air;'" and it was the *sine quâ non* in all cases of debility. My remonstrance was looked upon as being wholly at variance with the orthodox idea of the Practice, and the removal took place: but alas! after one month's residence, active disease of the tubercular character, aggravated by the change, made its appearance; and a return was clearly called for by almost daily increasing danger. Within

a fortnight or three weeks, after he did return home, he died.

A lady, twenty-five years of age, after being subject to much distressing cough, for which no medical assistance had been sought, was attacked with spitting of blood. The indication of treatment was plain—inhalation of medicinal agents, with tonics and digitalis, and entire confinement to the air of one room. By the adoption of these means my patient was rapidly recovering—cough lessened, appetite good, expectoration considerably less, no bloody sputa, and the hectic fever not so constant an attendant. It was at this stage of convalescence that anxiety for "Change of Air" was expressed. My opposition was useless. A sweet spot on the South-coast of Devonshire was selected, as offering the last possible remedy for my patient; and accordingly to that spot she was conveyed, where her symptoms became more and more aggravated, till death closed, in a short time, her earthly career.

Glandular diseases, affecting more particularly the chain of glands of the neck, or as I may term them, external glands, however strumously affected, are always greatly benefited by a sea-side residence, if not contra-indicated by some marked symptom of tuberculated disease in any internal organ. The pulse, and the continuance of hectic fever, will point out the line of proceeding.

A man of thoroughly sound constitution, two years since, fractured his knee-cap in a stellated manner, having fallen with considerable force on the pavement, after slipping on a piece of orange-peel. Six weeks found him all right, as regarded the union of the pieces of bone. His health, however, was much shaken. It was my opinion that the reactive influence of "Sea air" would do him infinite good; but his friends, notwithstanding, had him removed into the country inland, where he staid a month, without reaping any decided advantage; but adverting to my recommendation, he then went to Brighton for "Change of Air." After his

arrival there, he began to improve daily, and very soon returned home thoroughly restored to health.

In this case, let me observe, there was no excessive arterial action to interfere with his improvement. He required the exciting influence of an oxygenized atmosphere to produce vigour in a constitution debilitated by long confinement in one position. I might enumerate *hundreds of cases*, which have, from a defective knowledge of the influence of "Change of Air," terminated prematurely in death.

The treatment of diseases by panaceas and nostrums, falls every now and then into a lull, but seldom fails in a short time to start up again, in full vigour, as if the tendency to it were something inseparable from human nature. It would not be easy to mark down the various kinds of Drops, Elixirs, and Waters that have been trumpeted forth to the world. Magnetism, Mesmerism, Hydropathy, Homœopathy, all these have done serious evils in their day—

carried up into popularity, I may say, by the ascending swing of the great pendulum of human caprice, and flung down into obscurity as it returned in its oscillations, to give place to some other folly of the day, and then to sink again in like manner. The last and most universal of these panaceas, is "Change of Air." It is pertinaciously recommended, and forced upon every one, whatever may be the nature of the disorder of the suffering patient. He must take himself to some quarter of the globe, and release himself from the doctor's clutches, as nothing can renovate the body like "Change of Air." The dangers to health in the adoption of the practice so vehemently recommended by all, are indeed great; and many are the persons who have been injudiciously sacrificed, when suffering under any active, and even chronic organic diseases. Do we not find especial favourites for every Watering-place and Spa in Great Britain; and does not each individual consulted advise his particular locality for the successful treatment of the case,

without having acquired the knowledge, from practical experience, of its fitness? This is done both by medical men and the public. In the whole of the published works of past ages, nothing can be found on the subject, either precise, or of the least practical importance. Tuberculous disease, otherwise consumption, so often affecting the fairest of England's daughters and sons, is, without exception, increased in its intensity, by a removal to the sea-side, or the dry air of a hill or mountain. Antagonist action is what is wanted to stay the rapid confluence of symptoms in that fatal malady, and not pure air. The air of Rome, in particular, is much lauded as a suitable residence for such invalids; but how is it? Malaria, a cause of disease peculiar to the Campagna, is endemic; it is from this that the inhabitants suffer; and, singular to tell, the consumptive, already affected, rarely appear to be injured in their constitutions. The bane to others, is an antidote to them; and, as Milton says, "Evil, be thou my good." The equaliz-

ing of the circulation, or rather diverting to another organ the morbid secretions, tends to ward off the enemy for a time in the most efficient manner.

When the question of "Change of Air" is agitated, the most important feature to be examined, is the state of the pulse; for my observations have confirmed the opinion I originally formed, that in an adult, if the pulse is high, no benefit will result from the prescription "Change of Air," unless that air is known to be of a depressing tendency.

In recommending "Change," one or two seasons must not be taken as the average climate of a Spa, or a Watering-place. Meteorological observations, to be depended upon, ought to be taken for twenty years at least. Further, in the recommendation to stay the combustion in the lungs, a moist, low, marshy situation is preferable to high and dry, which latter is eminently adapted for the scrofulous or glandular diseases. The humidity of the atmospheric air is an essential in con-

sumption, as it occasions a tardiness in the circulation, and moderates the insensible perpiration. In some situations, the moisture of the atmosphere is such, that torpor and lassitude supervene. Damp places in cold weather, without free ventilation, will be productive of remittent attacks of fever; still this may be considered as an antagonist action to the tuberculous. Dry and cool air, from its possessing a sufficient degree of elasticity, is of decided benefit to hypochondriacs, by exhilarating the pulsations, and by rousing the nervous system to activity; but it is apt to generate inflammatory disorders by thickening the blood, and to produce congestion in the lungs; a thing to be highly deprecated, and avoided by those hereditarily predisposed to pulmonary disease of the tubercular character. Scrofula and phthisis no doubt require very different treatment, although often confounded with each other even by professional men, since I have known them to adopt the same curative means for both. In the former case, the pulse is

slow and feeble, and all the functions languid, demanding exciting remedies, and "Change of Air" at the sea-side, or in mountainous districts, calculated to increase the circulation; whilst in consumption, the indication is to diminish the action of the arterial system, by depressing and regulating the pulse to a moderate standard. Hence, the treatment beneficial to one, would be death to the other. This view of the subject is strikingly illustrated by Dr. Guggenbühl, who has established an Hospital for Infant Crétins* on the heights of Abendberg, in Switzerland. Crétinism, he considers, closely allied to scrofula; the symptoms of the latter being often, if not always, found in Crétins, and the same remedies being generally good for both. There is an interesting notice of this Establishment in Chambers's Journal for May 6th, 1848. Dr. Guggenbühl found, from the celebrated De Saussure down

* Those affected with the Goître, or pendulous tumour hanging from the throat.

to the living physicians of Switzerland, that all agreed in Crétinism never showing itself *above* the height of 4,000 feet on the mountains; and that children attacked by it, and immediately carried up into a purer and keener air, were sure to recover. Messrs. Schlublu and Buzzorini have shewn, by their experiments, that the human lungs absorb, in the mountain air, a much greater quantity of oxygen than in the plains. A fact indeed generally known. This increased absorption of oxygen, however, which is required also in the slow pulses of scrofulous persons, would infallibly destroy the consumptive patient, whose arterial circulation is already rendered morbid by excessive action.

The Registrar-General gives us weekly bills of mortality—appended to which are barometric and thermometric calculations as to the causes of disease, and especially the propagation of the Influenza and Cholera. Having found the suburbs more affected than London itself, during the late epidemic, many scientific profes-

sional men, who have joined the Sanatory Association, are at a loss to know exactly the occasion of so unexpected an occurrence, and so contradictory to the commonly-received opinions of the faculty. One says, "that Birmingham having an undulating surface, founded on red sandstone and gravel, and therefore drained by nature, far better than most places are by art, and higher above the level of the sea than almost any place in England, must naturally be freer from Cholera and other Epidemics than other localities." But if this argument were carried out, all places having an equally elevated site, and such a substratum of soil, would be exempt from the influences that occur in other localities; which is not the truth. Holland, a country well watered by canals, and perfectly level and low, was not visited by Cholera during the almost universal prevalence of that disease. The Medical Members of the Sanatory Association have stated in their Reports, that from water-courses and banks of rivers every danger was to be apprehended in

the highest degree; and still we find the Dutch escaped; but, say they, it is mainly because the people are distinguished for cleanness, which, they conclude, sufficiently accounts for their immunity from the disease.

Again, the Influenza, latterly so prevalent in England, did not attack the metropolitans with anything like the severity with which it did the suburbans, and people in the country. To my knowledge, many streets, narrow and without sewers, in Westminster, were almost entirely free from the Epidemic, whilst the gentry suffered intensely in various parts of the country, although living in houses supplied with every essential for health—pure water, abundance of food, and good drainages; and yet they became victims to it more readily than those in less favoured localities. Further, there are streets, certainly not furnished with a parish scavenger, where I know sickness generally prevails. Inquiring minutely into the cause, I found that it arose not from the situation, not from the miasmatous atmosphere, but

from insufficiency of food;—that children were neglected, without clothing for protection against the winter cold; and that in numerous instances the parents were habituated to drinking, and keeping irregular hours. Not so with families on either side of them in the same streets, who were highly moral and industrious, though in the midst of bad examples—the younger members eating, drinking, and sleeping with regularity. These continued in health, and looked ruddy and well.

Diet is another important matter for consideration in reference to health and disease. The nutriment varies, according to the physical character of the individual, his manners and customs. All vegetables do not flourish in the same soil. The Floriculturist understands thoroughly the nature of the soil which is required for the perfection of the growth of particular species of flowering-plants. The Dahlia will not thrive in clay, but needs a porous earth; the mountain heath will wither and die in the swampy soil of the reedy marsh.

The temperature of the atmosphere is another point in the cultivation of plants, which is closely observed; some languish, while others thrive. Animals are not all carnivorous. Man also, in his several stages of existence, is not nourished, in all situations, in the same manner. The food of the adult would be indigestible to the infant; and that of the infant insufficient and debilitating to the youth. So also do we find a difference between the food of the man of leisure, and that of the hard-working labourer.

In the anxious search after truth, no one has more fearlessly entered into the abodes of the poor in the metropolis, unmindful of their wretchedness and sundry abominations, than myself. Practical information being far above theoretical speculation, and feeling assured that our chemists, without medical knowledge to guide chemical analysis, could not be right in their views of the different agencies afloat in the atmosphere, and of their action on the human system; I was induced to prosecute enquiries

every where, in high and low situations, in gravelly and clayey soils, in houses ventilated and not ventilated, in houses with sewers and those without, and I find the inferences and deductions arrived at, although from their primâ facie evidence apparently correct, to be in reality wrong.

The solids and fluids which are consumed by the poorer classes in London and large towns are nearly all adulterated; the beers, ales, and porters have all been, as it is commonly termed, doctored; the cheap bread is adulterated; the gin, an article of too general consumption, is, I may say, poisoned. How can we expect, under such circumstances, and with so much dissipation in its broadest acceptation, together with excesses of various kinds, and a total disregard to the laws of nature, that the ratio of health should be favourable? But why attribute all maladies to the influence of what is termed the "*Disease-Mist*," singularly so called by the Registrar-General?

A man goes on a house-top, or on a monu-

ment top, and sees a thickening of the atmosphere here and there, and this is confidently spoken of by him as the "Disease-Mist," caused by the breaths of the thousands living in the quarter of the apparent fog. He may be very properly told, that if the wind had changed when he was thus ruminating in his lofty position, and it rose high, the whole face of the apparently foggy prospect would have changed, and he would have seen the once dark spot cleared off, as by a magician's wand: and, further, he may be told that it entirely depends in what part of the metropolis he made his observations. The wind, and quarter of town, will always cause an alteration in appearances.

Before last November—it was after that month that suddenly the Influenza Epidemic burst forth—a great peculiarity of the constitution existed for more than six months antecedent to the above date, and which was necessarily dependent upon some peculiar electric condition of the atmosphere, certainly not definable. I noticed in some hundreds of patients a remarkable

feature. Whatever the character of the disease might be, great irritability of the whole mucous surface of the intestinal canal was invariably found, much hepatic obstruction, and general uneasiness of the digestive organs. It must, however, be observed, that very few were obliged to withdraw from business, yet the unusual irregularity of the chylopoietic functions continued; in fact, the biliary excretion was interrupted until after the free administration of the chloride of mercury. Now, I have also remarked, that there was, both in London and in the country, during the twelve months previous to the irruption of Influenza (taking the whole four seasons unitedly) less bronchial and pulmonary affection, than in any similar period for the last fifteen years. I have been in the habit of frequenting public meetings, with the view to learn what interruptions are made by those affected with the above-mentioned maladies in the chronic form; but certainly in the twelve months already mentioned, there had been, whether in Westminster or Regent's

Park, or Hackney, or Islington, or any part of Surrey or Kent, less functional disorder of the respiratory organs, than at any period within my recollection; and this state of the human system appears to be attributable to a steady temperature, and steady pressure of the atmosphere, with positive electrical tendencies. But suddenly the face of things is altered, and we have other organs disordered, which were not affected before. It is a remarkable fact, that since the disappearance of the late epidemic, (March 1st, 1848), all pulmonary affections have almost ceased, and all descriptions of complaints of the schneiderian membrane and conjunctiva, so frequently present in catarrhal disorders, have been suddenly arrested, although we have the same officially reported sanatory condition of the Metropolis. I wish it then to be shewn, that these sanatory conclusions are not to be looked upon but with caution and some suspicion.

Every one is aware, that the first thing recommended to a patient apparently recovering

from *any* malady, by well-wishing friends and advisers, is "Change of Air." It is strongly urged; and, in a number of instances, the unhappy individual is forcibly ejected from his quiet home, to seek for health and shelter, either by the sea-side—a favourite recommendation, by the bye,—or on some hill-top, or some health-giving village, either in the north or south of England—east or west—from five miles, I may say, to five hundred miles, at manifold annoyances and inconveniences. Very rarely does the individual recover this *routing out* for a long time; and too often the air is pronounced either too sharp, or too close, and entirely unfit for producing improvement in the sufferer; the pulse already weak, and small, mayhap, is quickly still more reduced; and, in a number of instances, death closes the scene. I state this, to point out how perfectly needless is "Change of Air" in seven cases out of ten, more especially when neither medical men nor public writers can give any positive or clear information about the nature or con-

stitution of the air to which a patient is to be removed, and its known influence on the disease under which he or she may be suffering. In many diseases, *pure air* is not at all essential or necessary in the curative treatment of maladies. And I wish it to be understood, that my opinions regarding "Change of Air" are formed on the bed-side experience of many years; and some small credit may be accorded to me, for having been the first to disabuse the public mind of many errors which have been sanctioned under the authority of great names.

The Registrar-General, in his published account of the last quarter of 1847, says with reference to the Influenza, and epidemic diseases generally, that the mode by which contagion is diffused "is by means of the atmosphere, a subject on which the learned are as yet altogether in the dark, the analysis hitherto made having failed to detect any difference between the purest air from the mountain, and that from the pestilent courts of a crowded city;"

and yet he is able to distinguish clearly with his own eyes "a Disease-Mist" from a fog!

In tuberculous Consumption, with a general rapid pulse, the exhalation of carbonic acid is great; the purer the character of the air, the greater the pulsations, and the greater the inflammatory action for the maturation of tubercles; hence the danger arising to persons labouring under a disorder of the above nature upon removal to country air, and more particularly to sea-air. The fire already consuming the patient, does not require combustible materials, if you desire the sufferer to live; but a mixed and vapoury atmosphere, and at a fixed temperature, which can be best attained in a metropolitan residence. The first effects after a removal to pure air, are marked; and these too often mislead the judgment of friends: for first you have, by an accelerated pulse, caused by an accession of oxygen, an excitement of the brain, similar to intoxication, which erroneously impresses on the mind of the invalid an idea of decided change for the better. This illusion,

however, soon vanishes, and the real condition of his case dawns upon him.

A happy and even temper is an invaluable shield against the already excitable disposition of a consumptive patient; but how can you effect the object by removals, and "Change of Air." The pulse of irritation daily increases the tubercular deposits; and hence an earlier death.

The sulphuretted hydrogen, and other gaseous products of decomposition, have been supposed by nearly all the medical authorities who have written on the Sporadic Cholera, to create this latter disease, and even Influenza. I have reason to refute so strange a proposition, which is certainly not deducible from facts.

During the late epidemic of the Influenza, in many houses where commodes were in the rooms ordinarily occupied by the tenants, I have found a total exemption from any attack of the disorder; in fact, the pulmonary organs were entirely free from attack. This may be thought an extreme argument, but I do not wish it to be understood that I desire impurities should

displace purities, and that such a state of things is advisable for health; but this I know, that great exaggerations of the evils resulting from the decomposition of exuviæ have been made by many public lecturers, both medical and lay, on philosophical grounds; but such as are not tenable when opposed to practical facts.

The medicinal treatment of Consumption, by inhalations of chemical gases, is acknowledged to be the most efficacious of any of the means adopted in that dangerous malady; carbonaceous matter, even gas from coals, will, when judiciously administered, prove beneficial. This causes, in my opinion, a suspension of tuberculization; for how else can the fumes of Creosote, Pitch, Tar, Naphtha, influence the mucous surfaces of the lungs? Sedatives again, of vegetable origin, viz., Digitalis, Conium, Hyoscyamus, &c. have a like action; in fact, the main object seems to be to prevent too pure an element, in the shape of atmospheric air, from irritating the tubercular

deposits. The fashion then, at the present day, of recommending "Change of Air" in all kinds of cases, is fraught with the most dangerous consequences to the consumptive.

The large metropolitan hospitals, however well calculated for the surgical department of medicine, are ill-suited for cases in which much delicacy of constitution exists. I have known numerous persons who have been placed in the large wards of the hospitals, perhaps suffering under some adventitious character of disorder, but who could not endure them, (ventilation having been carried to a great extent in all the noble institutions of England, owing to the popular impression that pure air is the greatest of nature's benefits), as their lungs had been unused to respire an element, pure certainly, but prejudicial to those who have been accustomed to small rooms;—*habit* cannot, and must not, be too rapidly interfered with. I mean to say, our functions of life acquire *habits*, so to speak, according to the position of the individual in the world.

What think you of dieting a person in affluent circumstances, who can command all the delicacies of life, on old Dorset cheese and dry bread? why if you did not bring out the change gradually and carefully, you would starve your man. And you would starve, in like manner, the Dorset labourer, who had accommodated his stomach to the above commonly supposed indigestible diet, by compelling him to adopt the luxurious habits of a citizen.

Moisture has been considered as a great enemy to health; and all our late investigations on the subject have pronounced on the evils of inhaling vapours even of an aqueous nature. How will men of these notions be able to combat the oldest practice for the preservation of health, viz., early rising. The sun, first risen from its bed, spreads its effulgent calorific rays over the earth's surface, and causes evaporation; it is this watery vapour, so often objected to by valetudinarians, that is so conducive to the free respiratory action; it

is this, with the genial warmth of the luminary, that gives salutary influence to the circulation; not by expediting the circulation, but by the moisture and the electric rays equalizing and improving all the functions of life. All old people have uniformly adopted the practice of early rising.

Dr. Carpenter observes, "Independently of the utility of water as an article of *food*, and of the part it performs in the chemical operations of the living body, by supplying two of the most important materials (oxygen and hydrogen), there can be no doubt that a certain supply of moisture is requisite, as one of the conditions without which no vital action can go on. A cold drying wind shall be felt as invigorating to the relaxed frame, as it is chilling to one that has no warmth or moisture to spare; on the other hand, a warm damp atmosphere, which is refreshing to the latter, shall be most depressing to the former. All who have tried the effect of closely-fitted garments, impervious to moisture, are well aware how

oppressive they soon become, this feeling being dependent upon the obstruction they occasion to the act of perspiration, by causing the included air to be speedily saturated with moisture. When the fluids of the system have been diminished in amount, either by the suspension of a due supply of water, or by an increase in the excretions, there is a peculiar refreshment in a damp soft atmosphere, or in a warm bath which allows the loss to be replaced by absorption through the general cutaneous surface. The reality of such absorption has been placed beyond all doubt by observations upon men who had been exposed to a dry, hot air for some time, and afterwards placed in a warm bath; for it is found that the system would by this unusual means supply the deficiency which had been created by the previous increase in the transpiration."

The usual practice with me in the hot dry summer days, is to place several large flat dishes with water in the rooms of persons labouring under any attack of pulmonary disease, which

produces a considerable alleviation of symptoms.

"The effect of a moist or dry atmosphere, then, upon the animal body, cannot be by any means unimportant, although there exists in it a series of the most remarkable provisions for regulating the amount of its fluids. The influence of atmospheric moisture, however, is most obvious in disordered states of the system. Thus, in persons who are subject to a form of dyspepsia, called atonic, which is usually connected with a generally relaxed condition of the system, a very perceptible influence is experienced from changes in the quantity of atmospheric moisture; the digestive power being invigorated by dryness, and depressed by damp. Further, there are some forms of pulmonary complaints, in which an irritable state of the mucous membrane of the bronchial tubes has a large share; when this irritation presents itself in a *dry* form, *a warm, moist atmosphere* is found most soothing to it; whilst a drier or more bracing air is

much more beneficial, when the irritation is accompanied by a too copious secretion."

"There is a source of carbonic acid set free by the respiratory process peculiar to animals, and this consists in the rapid changes which take place in the muscular and nervous tissues, during the period of their activity—every development of muscular force being accompanied by a change in the condition of a certain amount of tissue. In order that this change may take place, the presence of oxygen is essential, and one of the products of the union of oxygen with the elements of muscular fibre, is carbonic acid. The same may be said of the nervous tissue. Hence it may be stated as a general principle, that the peculiar *waste* of the muscular and nervous substances, which is a condition of the functional activity, and which is altogether distinct from the general slow decay that is common to those tissues with others, is another source of the carbonic acid, which is set free from the animal body; and that the amount thus generated will conse-

quently depend upon the degree in which these tissues are exercised. In animals which are chiefly made up of the organs of vegetative life, in whose bodies the nervous and muscular tissues form but a very small part, and in whose tranquil plant-like existence there is but very little demand upon the exercise of their structures, the quantity of carbonic acid thus liberated will be extremely small. On the other hand, in animals whose bodies are chiefly composed of muscle, and whose life is an almost ceaseless round of exertion, the quantity of carbonic acid thus liberated is very considerable."

How beautifully does this explain the operation of the damage and waste of muscular tissue, by the regular and constant rapid action of the respiratory organ, evidenced by increased pulsations in pulmonary affections; and does not this clearly mark the importance of suspending, by all legitimate means, the rapid evolvement of carbonic acid? There can be no doubt that human life may be prolonged

considerably, by the application of rational means of treatment; and I feel assured, by the diffusion of practical views, much good will be attained. It is in disease that I would urge an examination of the grounds upon which I base my treatment, for physiological deductions have not hitherto added much to pathological conditions of the body, and to their improvement.

With the view of procuring a fair judgment, I had at the same time two patients of similar age, similar constitutional bias, and similar character of disease of the tubercular kind. I have not hesitated, when urged, to allow one of them all the fancied advantages from "change of air," viz., sea-side, or perhaps country air. This patient, perhaps, has been at every possible expense in procuring the best accommodation in some favourite locality, and has likewise had the best supply of azotized food; yet after a month's residence, the patient is found willing to admit that he does not perceive himself any better, but rather worse;

and further, he thinks, and his relatives and friends join him in the conclusion, that the place is not suited for him—the air is too bracing, &c. &c. A second change is followed with the same result; and, finally, he resolves on returning home. Here he again becomes my patient, and I find him almost *in articulo mortis*, but by proper measures and rest, he is able to linger on a short time, and dies. Now, the other patient, whose means would not enable him to drive about, is, by my advice, restricted to the use of one room, or two at the utmost; and here, by properly regulated temperature, and medical treatment, he exists, and continues to vegetate in a plant-like manner for nine months longer than the other individual.

I make this statement out of numbers of a like nature—tested and proved by experience to be the right course to pursue when an incurable disease has commenced its ravages in the lungs. Every thing which tends to accelerate arterial action shortens existence; while on the contrary, that which checks, sus-

tains, and equalizes the circulation, will most assuredly prolong life, in most cases, *from six months to a year and a half, and frequently longer*, and that in the latter stages of the malady. This is something to gain, and hence the really useful nature of the practice I have recommended.

The poet Cowper observes, in one of his letters to the Rev. W. Bagot, "You perhaps have never made the experiment, but I can assure you that the confusion which attends a transmigration (meaning a removal to another part of the country) of this kind is infinite, and has a terrible effect in deranging the intellects;" and I may add, deranging the health.

To an invalid, the preparations, the anxieties necessarily attendant on change of place, are great; even the Convalescent, however he may, by the kindness of friends and their thousand little attentions, be protected from the possibility of suffering the least uneasiness; yet the circumstance of going to an unknown place

will add excitement and acceleration to the pulse, which may occasion a recurrence of unfavourable symptoms. Fashion rules every thing; nothing appears to be more strikingly absurd than the almost daily removals of patients for the purposes of health, losing sight altogether of the importance of quietness, equable temperature, and numerous other appliances of the medical art! Food properly selected, and drink rightly ordered, will often do much more than "Change of Air."

The subject of ventilation, as at present pursued by chemists and others in this metropolis, has been considered purely in a theoretical point of view; it has not been treated as it ought to have been,—in a practical manner, from practical deductions. The houses of Parliament, club-houses, theatres, and large buildings, have latterly undergone much *boring;* the object of this latter process being to convey the pure element of air, and nothing else; as if purity of air tended in any way to the prolongation of human life.

For instance, *gluten*, the principal nutritious element of wheat, is not the material supplied unmixed; if, in fact, we were to live on this pure chemical matter entirely, we should die. We have other things of daily consumption, such as wines and fermented liquors; but we do not ask for *alcohol*. Again, tea and coffee, very wholesome as they are, are not substituted for *Theine* and *Caffeine*; in fact I might range over the whole of edible substances and always find that nature, and not chemistry, must be looked up to for regulating our conduct.

It is well known that the atmosphere, which is as necessary as food, is composed of oxygen, nitrogen, carbonic acid, and watery vapour according to locality. The attack generally made has been on carbonic acid,—that it is highly prejudicial to human life to have even an atom of it mixed with air. This I consider as absurd. Many persons find considerable advantage in being confined in small rooms, made almost air-tight, and yet

withal improve in general health wonderfully, —more especially, as I have before stated, if there be any tubercular disease to remedy. The Esquimaux, the Russians, and many of the northern tribes of Europe, shut up their huts almost hermetically, and yet suffer no inconvenience.

The carbonic acid is known to be eliminated both by the lungs and skin; its property is of a sedative kind, it quiets the whole system in small quantities, and is wholesome and necessary to the existence of mankind, as an All-wise Providence intended. Soda-water and Seidlitz-water have large quantities of carbonic acid in suspension; and who questions the exquisitely quieting influence of its action on the nerves and stomach? Not one! and yet what opposition has there been to inhaling this really beneficial gas. If water be impregnated with carbonic acid, it diminishes thirst, lessens the morbid heat of the body, and acts as a diuretic. It is highly esteemed in the cure of typhus fever, in irritability and weakness of the

stomach, and disorders of the kidneys. I am of opinion that oxygen in a state of purity is just as pernicious as carbonic acid, but the All-wise Creator has happily blended them for beneficial purposes, which do not appear sufficiently palpable to the theorist, who wishes, entirely on chemical grounds, to be supplied with oxygen alone! It has been observed lately, after much statistical discussion, that the average of mortality is as high in Marylebone and the City of London as the most unhealthy districts in the Metropolis. Look to this! After so much talking about sewerages and drainages, the places without them are found as healthful as those with them.

Notwithstanding numerous speculations in the present day, on the subject of the propagation of epidemics generally, very little as yet is known of the influence of atmospheric agents upon the animal economy, and their connexion with epidemic diseases. I do not wish to charge the Sanatory Associations and their promoters with any wilful exaggerations,

for we know that much good has resulted from the carrying out of excellent arrangements for the removal of animal and vegetable refuse in a state of decomposition, and which have tended to great good; all I wish, is to acquaint all men that the investigations they have made are only apparently correct; for I am convinced that both the diseases and the mortality resulting from them have not had their origin as stated by these gentlemen. Causes widely different have influenced constitutions, and these have not been traced to their proper source. The *influence of climate and season, diet, ordinary habits of life, and endemic and epidemic causes,* require to be taken into account, and we must not presume that we have arrived at a satisfactory theory of the origin of disease, until we have found one resting on irrefragable facts.

From certain experiments recently made by Professor Morren, of Rennes, "it appears that during winter and spring, salt water absorbs less atmospheric air than fresh water; that in

general *fresh water* dissolves 32 per cent. of oxygen, and from 2 to 4 per cent. of carbonic acid. *Salt water*, under similar circumstances, 33 per cent. of oxygen, and from 9 to 10 per cent. of carbonic acid. Further, that when *salt water* contains a great deal of oxygen, it gives it off to the atmosphere." So it would appear from the above experiments, that fresh water absorbs less than one-half of carbonic acid than salt water; and we must consequently have the advantages of this sedative gas in the pulmonary disease under consideration, for which a low situation, even near a river, is often selected by me. Oxygen is given off by salt water in larger proportions than by fresh water; hence its benefits to those requiring stimulating treatment.

When the pulse is required, in the treatment of a case, to be kept low, fearing daily lest the increased arterial action should bring into rapid existence even dormant disease, surely an atmosphere purer in itself, and possessing more oxygen, ought not to be

selected as a means of remedy; while, on the contrary, in scrofula and glandular affections, where the pulse is ordinarily low, beyond cavil or dispute, much more might be expected than the most sanguine mind would anticipate. My experience has extensively confirmed the theoretical view above written, and founded as it is upon extensive experiments.

It has been stated that the Irish poor, afflicted with famine fever, or a species of typhus, last year, were to a greater number mortally affected by confinement in Hospital wards, than when they were nearly exposed to the elements; in fact, the favourable influence of almost entire exposure tended most beneficially to the recovery of the patients. Now, whatever is applicable to the Irish, is not, I conceive, strictly applicable to the English. The former people, from birth, are exposed night and day to the external air; rain, wind, and cold rarely affect them (I mean only the lower order); in fact Nature seems to prepare or fortify itself against external agencies; and these

people in consequence are unable to bear the confinement to any room, however well ventilated. But the English, on the contrary, are brought up differently from the "cradle to the grave;" their minds are all associated with comfort, and all are well provided with clothing, fuel, apartments, and look to a comfortable settlement as one of the greatest elements to happiness. They are not habituated to the changes of the atmosphere, and are unfit subjects for out-door exposure in health or disease. My opinion then is, that if the English had been served or abandoned in a similar way to the Irish, the deaths would have been fearfully greater by the adoption of the Irish policy.

I have already mentioned that the Cholera did not attack Holland, and the supposed immunity from the disorder was thought to arise from the general cleanliness of the Dutch people; and this has been, as it were, oracularly pronounced by the Sanatory Commissioners, and every body now seems to believe in that statement. Late experiments have shewn and

proved that sulphuretted hydrogen is largely diffused over Holland. We are aware that dikes or canals intersect the country in all directions; that when the tide recedes, a great quantity of sea weeds is left to decompose on the strands. Now the sulphate of soda is a prominent salt in sea-water; and which, although not decomposable by ordinary chemical means, yet is easily decomposed by the agency of warmth and fuci; the result is the evolution of sulphuretted hydrogen. The odour from this gas is perceptible to any one visiting Holland, and no evil or deleterious consequences ensue, nor does it propagate cholera.

The Sporadic Cholera has been known to defy all human efforts for its suppression. Every one knows, at least all medical men do, and old Indian medical officers in particular, that the above fatal malady, in its epidemic form, has hitherto travelled with irregular but tremendous strides from the plains of Hindostan, and passed onward, like the determined march of a conquering army, ravaging and destroying, with equal mor-

tality, the inhabitants of the Hindoo Kosh, continuous with the Himalayas, which are calculated to be 25,000 feet above the level of the sea, as it did those in the Sunderbunds in Bengal; which is not to be accounted for under the ordinary laws of the propagation of diseases.

There was no exemption from the attacks either in valley or hill; either at a temperature of 120 degrees, or at below Zero. From the equator and torrid zone, the epidemic, without losing one atom of its character or virulence, passed onward, Northward, to the Caucasian Mountains, and over them, and down again onward almost to the Arctic Circle. And here in Russia medical men observed that it frequently passed on to different places, heedless of the assistance of the winds; for many places were ravaged by that fell disease, though the winds continually blew in a direction from an uninfected part, and yet grievously suffered; no communication having taken place between affected and unaffected neighbourhoods.

I have stated that sulphuretted hydrogen was supposed by many to be the cause of Cholera and Influenza; but I forgot to mention that Dr. Prout, a distinguished man in the profession, remarked at the time of the prevalence of the cholera in England, that the atmosphere contained a peculiar gas, viz. seleniuretted hydrogen, a compound of the metal selenium and hydrogen gas; selenium is a volcanic product, and fogs are preceded by volcanic disturbances; he says, "Is it therefore conceivable that some compound seleniuretted hydrogen, perhaps with ammonia, is the cause of the fog, or at any rate of its disease-producing properties?"

I would ask whether it is known (to strengthen this theory) that the inhabitants of Sicily and Naples are subjected to complaints affecting the mucous membranes, either inducing cholera or influenza; for in localities near the volcanoes of Etna and Vesuvius, the seleniuretted hydrogen must predominate. Berzelius, who experimented with this gas on himself, says, "By allowing a minute bubble of this gas, as large

as a pin's head, to enter into the nostril, all the symptoms of a very severe catarrh took place, and which lasted for some days."

I wish it to be understood, then, from the above remarks, that to assign one particular material as the cause of an epidemic, is not rational or correct; that because one locality escapes from the prevailing epidemic, we are not to jump to the conclusion that it is from some tangible cause, and that only. Too numerous are the agencies afloat at particular periods, which produce disease, and as yet no meteorological observation, nor chemical analysis, has had the effect of clearing up the mysterious point.

And now a word or two about Diet.

Professor Liebig has ingeniously made the distinction between what he terms *plastic elements of nutrition,* and *elements of respiration.*

"To the former class belong the following substances:—

Vegetable fibrine;
Vegetable albumen;
Vegetable caseine;
Animal flesh.

"To the latter:—

Fat;
Starch;
Gum;
Cane Sugar;
Grape Sugar;
Milk Sugar;
Pectine.

"In the *flesh-eating animal*, the waste of the tissues is very rapid, the temperature being, as it were, kept up in a great measure by the burning of AZOTIZED matter; in a *vegetable feeder* it is probably not so great, NON-AZOTIZED substances being consumed in the blood, in the place of the organic fabric."

I have made the above extract to shew the burning action or combustion during the chemical changes in the lungs, when a too highly azotized diet is adopted in pulmonary com-

plaints, and relatively to shew what dangers must ensue in tuberculous cases by having a too exciting air likewise received. Thus, azotized materials, in too large quantities, in the food of persons labouring under the above-named diseases, would preternaturally increase the circulation of the blood, and would require elimination by great exercise of the body; strong nitrogenous food is necessary for persons who are in the enjoyment of health, and who can take sufficient exercise to promote good digestion.

The same kind of aliment is not requisite nor proper for the weak, when that weakness is dependent on the tuberculous cachectic constitution. Every one knows that the appetite of such persons is really and truly enormous in many cases of Consumption, and that from the full indulgence of such cravings, no strength, but weakness results. Now it is clear that the inordinate supply leads to the rapid chemical changes in the lungs, hastening, rather than retarding, the destruction of the

tissues, and diminishing the nutrition of the body; while, by moderation and judgment, guided by the pulse, a too stimulating diet would not be applied. In Scrofula, quite a different condition of things exists, and we may daily observe the improvement occasioned by a highly azotized regimen.

There is one peculiarity connected with Scrofula which draws a striking line of demarcation between it and Tubercular Consumption, viz., that the former is commonly developed without the presence of tubercular matter; and there is, in consequence of its absence, a widely different radial pulse, compared with that which is found in Phthisis. In Scrofula there is more or less an impoverished condition of the blood, as proved by chemical analysis; and in proportion as this exists, so is the strumous habit manifested.

In the Animal Chemistry of the celebrated Simons of Berlin, we are told that in Scrofulous affections the blood is *deficient* in solid constituents, especially in *fibrine;* and it is in-

ferred from the corpuscles, viz. blood globules, being somewhat devoid of colour, that there is a deficiency in the quantity of saline matter in the blood of scrofulous persons. In Consumption, however, it has been observed, that whatever be the stage of the disorder at which the blood is analyzed, the *fibrine* seems always on the increase, and the corpuscles on the decrease; and further, generally speaking, it seems that the amount of *fibrine* attains its maximum about the period when the febrile symptoms are regularly established, and the decrease of corpuscles was almost always found to be accompanied with a corresponding increase of *fibrine;* but the proportion or quantity of saline matter is generally normal. Professional men are well aware that the *fibrine*—when in excess in the blood—the presence of which is marked by rapid circulation, incident to inflammatory diseased action, is readily converted into the *buffy coat* when the blood is quickly abstracted from the system; and whenever this is present, there is

always accompanying it an increased arterial pulsation. By the analysis given above, it will readily be appreciated, that as there is an increased supply of *fibrine* in the consumptive constitution, (when the disease is irrecoverably established), there is more necessity for depressants being employed, according to the ordinary laws of medical treatment, than excitants, as a means of relief.

In relation to the chemical phenomena of respiration, it is known that the exhalation of carbonic acid is greater according to age and much muscular developement. The older a person becomes, the carbonic acid gradually decreases in proportion, and as the respiratory impulse is diminished by such a state of things, we know its advantage in the reduced pulsations or beats of the heart; the usual proportion between the respiratory movements and the pulse being as 1 to 4½ or 5,—it may become in Pneumonia as 1 to 3, or even in some cases as 1 to 2.

Professor Matteucci, on the Physical Pheno-

mena of Living Bodies, says: "Besides atmospheric air, oxygen and protoxide of nitrogen are capable of maintaining respiration for some seconds. Perhaps in oxygen this function might go on for some time, but when this gas is breathed in a *pure* state, the respiratory movements are more frequent, *the arterial pulsations are accelerated,* and the whole blood becomes of a very brilliant red. In protoxide of nitrogen, respiration goes on for some seconds without serious inconvenience; but, as in oxygen, the *respiratory movements are accelerated,* the *cerebral functions disturbed,* and a kind of *intoxication* supervenes."

Further he says, "that the respiratory function is a purely physico-chemical phenomenon; that the gases dissolved in the venous blood are set free by the absorption of other gases; that a portion of the carbonic acid of the venous blood is exhaled by its absorption of the oxygen of the atmosphere; that the carbonic acid expired, at least the greatest part of it, is not formed on the lungs; that this gas exists dis-

solved in the venous blood, and is set free during the act of respiration, in presence of the oxygen which is introduced in its place, in the same manner as it is with azote or hydrogen in the artificial respiration of these gases; and lastly, that it is evident, from the experiments of Magnus, that the quantity of carbonic acid gas contained in the five pounds of blood which pass through the lungs in a minute, is nearly double that which is exhaled in the same space of time."

These extracts shew the peculiar function of respiration, but although it is demonstrated by experiments with reference to the dangers of pure oxygen and protoxide of nitrogen to the vital system, yet the mixed gaseous products of large towns on the human constitution, or rather on tubercular lungs, have not hitherto received any inquiry. I speak practically of their benefits in various disorders, having for their germ the tubercular diathesis. Louis, who is the first authority in Europe in Tuberculosis, asserts, that where predisposition

exists to deposits of this nature, they may take place in every organ of the body, and exhibit themselves by the presence of hectic fever.

In proof of my deductions, I will mention one curious fact out of many, which will direct attention to what may have hitherto appeared anomalous and inconsistent. In my inquiries regarding the sanatory condition of large towns, I have come to a conclusion as to their salubriousness somewhat at variance with those of Sanatory Associations generally. We have, to the north side of the Thames, and above Vauxhall Bridge, the Equitable Gas Works, and along its north eastern boundary there passes a large *open* sewer, conveying abundance of animal exuviæ in solution. At its termination into the Thames, there is an iron bridge, on the top of which, and at the opening of the large floodgates, stands a small house, erected for a small family.

The Commissioners of Sewers have appointed a person to attend to the ordinary requirements

during the changes of tide. Of this individual, who has his wife on the premises, I made strict inquiries about his and her health. It must be added that, like a bird's nest, his habitation is perched over the sewer, and of course the unpleasant vapours of a mixed character are perpetually rising or evolving, and these two individuals are respiring this air almost constantly; and strange to many it will appear, that the man's health, for nearly three years he has had charge of the place, has never been better. He has all the characteristic appearance of being consumptive. Before he had his present abode and employment, he had considerable spitting of blood, and he says his appetite is now good, and he ails nothing.

This man's lungs do not appear at present to have the form of any acute disease, and it is my impression that, with his complaint, his life is really prolonged by the atmosphere he is thus accustomed to breathe. His wife, too, enjoys good health. I have been told that they are frequently up all night waiting

changes of tide, to open or close the floodgates. The pulse of the man under this mixed impure atmosphere, is about 75 in the minute, regular and soft.

I think that the pointing out of a simple and rational method of procedure in the *ultimate* treatment of disease, when medicines are found to be unavailing, is a matter of the highest importance, especially as we have hitherto had no rules upon which to place reliance. The administration of medicine is the *primary* means employed for removing diseases, for by strictly medical remedies, we can cure symptoms, and afford alleviation of pain; but we cannot produce a radical change in the human constitution, whether suffering from chronic or acute disorder, without long-continued and scrupulous attention to food, drink, exercise, and *air*.

The practices of a by-gone age in pulmonary Phthisis, are not likely to be supported in these days of sanatory improvement; and although these practices are opposed to all the

present views of the treatment of such diseases, yet I can readily imagine, that the observation in medicine of our forefathers was as acute as that of modern practitioners. The plan pursued by medical men half a century before Buchan's time, was to recommend patients affected with any delicacy of constitution and cough, early every morning to frequent cow-sheds, sheep-folds, stables, farm-yards, and even slaughter-houses. The object of the practice clearly was, that they might inhale the emanations disengaged from the putrifying animal and vegetable matter, charged with carbonic acid; and such a course must have been followed, in many cases rightly selected, with great benefit. Irritability and excitement being lessened by the mixed nature of the air, there became consequently an abatement of active symptoms. Delicate texture of the lungs will be readily *broken down* by too pure an air, as by habits of intemperance; and the turbercular diathesis being lighted up, will soon bring about the destruction of the sufferer.

I will introduce here some paragraphs which support my views, from a paper recently read before the Statistical Society by Dr. Guy, who has added many useful facts to the subject.

"I was induced," he says, "to enter on the enquiry of the health of scavengers, bricklayers' labourers, and brickmakers, in consequence of an application made to me by the owner of a laystall indicted as a nuisance, that I would examine its effect on the health of the neighbourhood. I visited and inspected eleven laystalls. In most of the laystalls, or dustmen's yards, every species of refuse matter is collected and deposited—night-soil, the decomposing refuse of markets, the sweepings of narrow streets and courts, the sour-smelling grains from breweries, the surface soil of the leading thoroughfares, and the ashes from the houses. He next made careful comparison between the health of scavengers, bricklayers' labourers, and brickmakers; and he found the scavengers fully equal in health, if not superior, to the

other labourers. Out of 96 scavengers and nightmen, he found that 51 had never been kept away *one day* by illness, and that 16 had never been kept away *one week* by illness; while the bricklayers and brickmakers showed a much larger proportion of absentees under those heads."

Long since, Sir Anthony Carlisle noticed the slight liability to fever of the men employed in cleaning the sewers. Thackrah states, "The nightmen of London are generally healthy, notwithstanding their disgusting occupation—appetite, they declare, is increased by the effluvium. Their only complaint is defect of food from lowness of wages." A man, who accompanied Dr. Guy in his inspection of the scavenger's premises, says, that "he perfectly well recollects, thirty years ago, seeing as many as twelve patients, directed by the faculty of that day, to walk round the shoots for night-soil on his father's premises, and inhale the fœtid emanations."

Dr. Watson says, "that neither animal nor

vegetable decomposition is sufficient to generate fever."

Dr. Christison says,—"Since continued fever clearly originates often in propagation from the sick to the healthy, it becomes a second question of much interest, whether it originates in any other cause."

Dr. Guy further observes: "I do not think that, whether in town or country, such another body of men as the scavengers could be brought together except by selection; and it is not going too far to assert of them, that if the comparison were limited to the inhabitants of London, or our large towns, no score of selected tradesmen could be found to match the same number of scavengers brought casually together. Whether they are measured by their ruddy complexions, their portly figures, or their general appearance, they are certainly a very remarkable body—the more so, as the majority have been in trade all their lives, and have lived on their premises in town."

From my professional knowledge of the

scavengers in general, I believe them to be far more steady, industrious, and domesticated, than the brickmakers and the bricklayers' labourers; to which in some measure may be attributed their superiority in point of health; and I feel assured, if Dr. Guy had known the relative habits of the labourers in question, he would not have come to the conclusion, that the increased ratio of mortality among bricklayers, &c., arose so much from the nature of their business, as from more irregular and dissipated habits, occasioned by their command of superior means, arising from higher wages.

I shall now add some particulars respecting the pulse, conceiving it to be the true medium upon which the recommendation to invalids of "Change of Air" ought mainly, if not wholly, to depend. The following are the ordinary pulsations of health:

In the adult from	70 to 75
At puberty	80 to 85
At the second year	95 to 100
In early infancy	120 to 150

But of course this is a state from which there may be some deviations, and these deviations have been considered in a different manner by different practitioners. There can, however, be no two opinions regarding the strength, regularity, or freedom of the pulse; all these conditions may be present in a healthy individual; but then we have the hard, the wiry, the frequent, the undulating, the intermitting; and these particular states of the pulse will tell to an experienced finger, pretty clearly, the condition of the patient, whether any active or lingering organic disease has been called into existence.

Whether old or young, a proper examination of the tone and character of the pulse will be the surest guide to the medical practitioner what course to employ, in addition to treatment, in the numerous distempers in which "Change of Air" is recommended. The state of the pulse is unquestionably a sign of great value to diagnostic precision; any abnormal kind of arterial beat shews too

often organic, if not functional, disorder; and we must apply "Change of Air" to individual cases, according to the nature of the complaint.

As Digitalis is given with extraordinary benefit to arrest the rapid circulation in the incipient stages of phthisis, so we may be certain, reasoning from analogy, that danger will assuredly result to such cases by undertaking any means by which the arterial beats are increased. Dry pure air, or even sea air, will produce that effect; while moist air, if of an equable temperature, mixed, as it may be in valleys, by various matters evolving carbonic acid, or inhalations of sedative herbs, will consequently be more applicable *than the supply of the purest atmospheric air* that can be respired. The slow combustion of carbon is attended with less evolution of electricity; as it is a well known fact, that whenever fresh oxygen enters into chemical union in the body through the lungs, heat is evolved.

The use of the examination of the pulse,

as an index of health and of disease, appears to have been well understood from the earliest ages of Medicine: for myself, I place greater reliance on it as a means for the detection of disease than any other yet discovered. The Stethescope is adapted for those who have an acutely sensible auditory organ, but who, from that organ being in an exquisite state, are very rarely blessed with the other four senses, viz., tasting, smelling, seeing, touching, or feeling, in any degree of perfection.

In examining the pulse, reference must also be made to some standard, to determine whether the number of pulsations so measured should be considered as falling short of, or as exceeding, the average or just quantity. This standard, it is evident, ought to be the number of pulsations which the artery of the individual so examined makes, in a given time, under similar circumstances, in a state of health; although it is liable to vary, from many different circumstances.

The pulses of women are considered quicker

than those of men. The difference of temperament is another cause of the difference of pulses. The stature of the body has some influence on the pulse; the pulse after feeding and after fasting ought to be well known in the person under examination.

My own pulse beats, in the ordinary way before dinner, 74 times in a minute; and after dinner 80 times. In the morning, after waking, when in health, it is slow and quiet, and about 72 times in a minute. It is in sleep that I can get the pulse in its proper condition in my patients.

From the absence or the suspension of the numerous exciting causes affecting both the mind and the body, which take place in a waking state, it may reasonably be supposed that the pulse would be slower during sleep.

Exercise is well known to quicken the pulse; I have made many experiments under moderate exertion. The effects of bodily motion are as follows:—Lying down, 72; sitting, 74; stand-

ing, 76; walking at the rate of three miles an hour, 80; running will increase the pulse to 130 and 140. Speaking is a kind of exercise which has an effect on the pulse; hence silence is recommended to patients who have any feverish symptoms.

Mental agitation of every kind affects the pulse, and certainly accelerates it. Having before spoken of the usual circumstances by which the pulse is liable to be affected in a state of health, I shall now speak of the changes that are produced by disease.

The *acceleration of the pulse* is agreed, by all medical writers and practitioners, to be the leading mark that truly indicates the presence of any latent character of disease. Some rare instances, indeed, are said to have occurred wherein the pulse has not been altered from its natural standard, but these are too few to require being noticed in this place.

I have drawn my inferences of the presence of hectic diathesis from the absolute number of pulsations which the artery makes

in a given time, particularly if the beats exceed the ordinary pulsations of health by 15 to 30 in the minute. In an adult, 84 beats in a minute are, I believe, usually thought to denote the commencement, or rather perhaps the lowest degree, of fever; 100 may be considered the usual rate in hectic fever; and 110 to 125 the number that commonly attends truly inflammatory diseases more commonly affecting the lungs or pleura. When the pulse rises higher, you may have delirium or insensibility; and too often this may be considered as an unfavourable prognostic. Where the natural pulse, in point of quickness, is higher than 70 or 75, of course we can have no reason to suppose that *disorder*—which, from the meaning of the term, is a derangement of the regular course of nature—should at once reduce a number of discordant pulses to the same rate. The natural pulse is found in some persons to exceed that number which implies a considerable degree of fever; and in others the presence of

that disorder is strongly marked, though the number of the pulse may not reach the pitch that is supposed to indicate the lowest degree of that disorder. To obviate this inconsistency, the number of the natural pulse, be that what it may, has been fixed as the standard from which the increase should be computed; and a certain number of beats exceeding this point, 20, 30, or more, has been assumed as criteria, either of the presence of some disorder, or its different stages.

In all chronic diseases of the chest, the discriminating and judicious medical practitioner learns from the pulse the progress of disorder, and consequently cannot fail to be struck with the absurdity of the custom, introduced and persisted in by many, of making but a momentary and slight examination of its tone and character during a state of disease. I have been long satisfied that it is impossible for a medical man to second or assist nature, in the tubercular diseases generally, when needful, if he refuse to listen to her voice by

neglecting to make a regular clinical or bedside examination of the patient's pulse; during which important inquiry, any distraction of the attention, either by talking or otherwise, is highly reprehensible. The pulse exhibits itself hard, strong, tense, irritated and frequent in the Hæmoptysis, or spitting of blood, *arising from plethora;* and it is small, deep, tense, and frequent, in the Hæmoptysis proceeding *from organic disposition,* which prevails in cachectic people of both sexes and of every age.

In Influenza and general catarrhal affections, it shews itself irritated, full, and frequent, when the disease is violent or hypersthenic; and it is small, weak, and frequent in the pulmonary catarrh complicated with adynamic fever; the pulse becomes irregular, intermittent, and convulsive, when to the other symptoms of the pulmonary catarrh is added the pain which increases in consequence of the efforts of the dry cough, followed by some expectoration of mucous matter.

In general, the more the bronchi of the lungs are obstructed with mucus, and the more difficult respiration becomes, the intensity of the pain increases in proportion, and the pulse consequently shews itself smaller, more irregular, more irritated, and more frequent; and its intermittency becomes always more pronounced, as is observed in the suffocating catarrh; so much so, that the respiration is then difficult, short, noisy; and the intermittence of the pulse, together with other symptoms, concur in showing the great obstruction of the bronchi.

The pulse again is full, rather soft, and not at all irritated, at the commencement of Hydrothorax, or water in the chest. For as the effusion of the serous fluid, which may take place in both the cavities of the pleura, does not alter, in any great degree, the order of the movements of the heart, upon which depends that of the beatings of the pulse, this cannot yet shew itself irritated, as it afterwards does, always in conformity with the progressive

accumulation of water in either cavity of the pleura. The difficulty of breathing finally appears, and to this cause the frequency and irregularity of the pulse are always proportioned. The pulse is hard, thin, convulsive, small, and frequent in the paroxysm of Asthma, in which the dyspnæa, the hissing of the respiration, and various other signs of this kind, equally concur.

The diagnosis and prognosis of Pulmonary Consumption are connected with the pulse, which announces its existence, and enables its termination to be foreseen. In fact, besides the hot and burning sensation which we feel whilst examining the beatings of the artery of a consumptive person, there likewise concur the rapid frequency and celerity of the beatings of the pulse, which are rather small, hard, quick, and somewhat irregular, in the morning; and quicker, more irregular, and somewhat elevated, in the afternoon. The perspiration, with expectoration of pus and mucus, comes on in greater or less quantity in the advanced period of the night; a certain obscure

redoubling, as it were, of some of its dilatations is felt, and this, united with other attributes of the pulse, gives a certain and sure sign of the successive suppuration of the tubercles.

Relying, therefore, on the pulse as a means of prognosis, it is incumbent on the Medical Practitioner not to advise convalescents "Change of Air" to any place or locality where, from natural circumstances of position, an increased pulsation is likely to be acquired: knowing full well that whatever tends, in even the slightest degree, by stistimulating action, to add an increased pulsating power in the system in diseases of the chest, will assuredly contribute to diminish the period of existence.

It will be clearly seen from the foregoing observations, that my great object is to undeceive the public mind on the subject of "Change of Air," and to point out the course that ought to be pursued in that respect with reference to Consumption and Scrofula; con-

vinced as I am of the extensive mischief that has been done by a mistaken and indiscriminate recommendation of change of climate, when no such change is called for. "Change of Air" requires to be employed with the same precaution, care, and judgment, in the cases under notice, as substances of the Materia Medica. A small dose may be fatal to a patient when not rightly administered, while a large dose of the same may prove not only not pernicious but highly necessary and beneficial.

We all know that sea-air is pure and bracing, and that it is impregnated with a slight proportion of saline matter, common salt, iodine, bromine, and some others; and these substances, in an aerial form, by acting chemically on the system through the lungs, have relieved cases of Scrofulous character; and we have, on the other hand, on the land, more particularly in rural plains and valleys, a more mixed kind of atmosphere, in which various particles of gases of different

kinds, according to locality, are combined; and this is better calculated for the delicate chested — otherwise the consumptive, — than an atmosphere in which a large portion of oxygen is contained.

NOTE.—The following extract from a late Number of THE LANCET fully corroborates my views of the influence of Epidemics:—

"Dr. Colin has given, in the Archives de Médecine for April 1848, a very excellent description of an Epidemic of Dysentery, which broke out in M. Louis's wards, at the Hotel Dieu, Paris, soon after the great heat of the summer of 1846. In the space of three months no less than 34 women, who had been admitted for various other diseases, were attacked. Of these 34 patients, 16 died, 10 were cured, and 8 left the hospital in a fair way of recovery. It is very curious to notice,

that the wards here spoken of, are the *best kept*, and most *carefully ventilated* of the whole establishment, yet that the epidemic was *strictly confined to them.*"

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BY THE SAME AUTHOR.

Shortly will be published,

THE INFLUENCE OF VARIOUS LOCALITIES ON HEALTH AND DISEASE.